DOCUMENT RESUME

ED 192 840 JC 800 519

TITLE A Guide to Making Intelligent Computing Decisions.
INSTITUTION American Association of Community and Junior Colleges, Washington, D.C.; Association of Community Coll. Trustees, Washington, D.C.
PUB DATE [80]
NOTE 16p.; Photographs will not reproduce well

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College Administration; *Community Colleges; Computers; Consultants; Cost Effectiveness; *Data Processing; *Decision Making; Equipment Evaluation; Equipment Utilization; *Governing Boards; Guidelines; *Information Systems; Long Range Planning; Needs Assessment; Professional Services; Staff Utilization; Two Year Colleges

ABSTRACT

Decision-making guidelines are presented as an aid to community college boards faced with the problem of acquiring and implementing a data processing system for administrative and/or instructional use. After introductory material noting the increased demand for data processing education and the desirability of using computer technology in the collection of data for reporting purposes, the guidebook outlines factors to be considered in a seven-step, decision-making sequence. This sequence involves: (1) assessing computer technology currently in use at the institution and determining future needs; (2) preparing a short- and long-range computing services master plan; (3) establishing objectives and priorities for the tasks to be completed by the academic and administrative segments of the data processing system; (4) determining personnel needs; (5) establishing a governance structure for the system; (6) choosing needed hardware; and (7) determining the system's cost effectiveness. The guidebook concludes with a discussion of the use of consulting firms specializing in educational computing services. (JP)

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A GUIDE TO MAKING INTELLIGENT COMPUTING DECISIONS

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In response to numerous requests, the American Association of Community and Junior Colleges (AACJC) and Association of Community College Trustees (ACCT) have joined together to present

A GUIDE TO MAKING INTELLIGENT COMPUTING DECISIONS

We are grateful to the management and staff of Systems & Computer Technology Corporation (SCT), of Malvern, PA, leaders in providing computing resource management and systems development in higher education, for their assistance in researching and writing this brochure.

THE COMPUTING DECISION FRAMEWORK

In a time of decreasing enrollments and increasing competition among institutions for the students who are pursuing higher education, many of our member community and junior colleges have discovered that they must offer both their potential students and their graduates something special in the way of career preparation.

They understand that the graduate who is well-schooled (or at least familiar) with computing is a desirable commodity and, in a tight job market, students choose to attend schools which can offer them salable (or marketable) career tools.

Aside from these academic considerations, a community or junior college must compete with other similar institutions for state and local funding. Often complex reports or detailed budget analyses are required to obtain increased funding from a local or state legislative body. This is particularly crucial in the present Proposition 4 and 13 atmosphere.

An efficient, effective, sophisticated computing resource is, therefore, an essential, rather than a frill, to most two-year institutions today.

A question then: With the amount of dollars that are spent on computing hardware, software, and personnel, why do many of our members allow their computing decisions to be made by "technicians?"

The evidence seems to indicate that although trustees and administrators are concerned, quite reasonably, with the quality (and cost-effectiveness) of computing on their campuses, they are either intimidated by the specialized jargon generally associated with computing or don't recognize the overall importance of an efficient computing resource in today's educational environment.

One need not converse in bits and bytes, multiple drives, or floppy disks to sensibly evaluate what internal computing personnel—and outside vendors—are proposing. All that is needed is to be able to ask the proper questions to insure that you and your institutions are getting a proper return on every computing dollar invested.

Certainly, none of the college administrators and board members responsible for this decision-making process want to be the target of criticism if the new computing resource experiences operating problems, if the hardware goes down every day at its busiest time, or if the software requires so much debugging that it would have been easier to perform the task manually. In short, no one wants to make the important decision to expand computing capabilities only to realize that a great deal of money has been spent with little or no return on the investment.

This need not happen if, as with other projects, the right questions are asked and the appropriate thought given to specific requirements. If the decision is put in the proper perspective, it becomes very similar to one concerning any other major expenditure facing college administrators.

For example, if a new building is required, a need must first be demonstrated. General specifications must be established as to its size, capacity, and functions. Neither the administrator nor board member needs to be concerned (or closely familiar) with all the materials and methods involved in its construction. Details such as BTU's of heating/cooling, the specific type of electrical conduit, the brands of plumbing fixtures, and the kinds of tools used by the construction workers are likely to be beyond the interest of the typical board member and/or administrator.

What is important—even critical—is that the college must first understand why and how the building will be used, by how many students and faculty members, the ongoing associated cost factors, and in what way the building fits into long-term plans and goals. Once these points have been decided and agreed upon, the role of the board member and trustee is to identify the appropriate resources for implementation (architects, contractors, etc.), make the selections, and monitor the progress and performance once the contract has been awarded.

This decision-making process is the same for computing, except the choices differ in kind as much as they do in degree. Therefore, as a service to our members and in response to many requests, we have written this **Guide to Making Intelligent Computing Decisions** to help you develop a more cost-effective, efficient, and user-responsive resource for the 80's.

Black Hawk College President Dr. R. Puffer (center) and Dr. C. Carlsen (right), Provost and Vice President for Academic Affairs, Quad-Cities Campus, review administrative computing systems.

ASSESSING PRESENT CONDITIONS AND FUTURE NEEDS

The first and most important task your board must perform (with senior management) is the determination of what role computing is currently playing in your institution, then what projected needs for the future may be. You should ask questions of your administration and of computing resource users:

- Are they satisfied? Are their needs being met?
- Is the computing resource functioning up to par, considering whatever budgetary constraints exist?
- How are your peer institutions using their computing resource? Do they use "batch" or "on-line" methods? Do they have an academic computing component? How extensive is it? And who is running their computing operation? Is it being handled in-house or by outside, professional management?

Chances are that criticisms about the inability of existing systems to meet user needs already exist if your institution's computing resource is inadequate. Everyone has read about

the impressive accomplishments of computers and has seen them function in the course of daily activities. And they wonder why they can't have increased computer access to make **their** jobs easier.

The next step in resolving computer complaints is evaluating needs:

- In what specific areas might computing improve operating efficiency?
- What scope of services will be needed to satisfy administrative, faculty, and student users?
- What types of services should your institution be offering? How realistic is your budget, and what additional computing services could be obtained even within your current budget? Will your contemplated expenditures be adequate in a cost/performance ratio in years to come?

Keep in mind that with the proliferation of courses and study programs demanded by today's students, along with the multi-campus locations that are part of the typical junior college environment and increased student mobility, it is no longer practical to rely on outdated recordkeeping functions. Paperwork deluges today's colleges. The government requires mounds of statistical reports for the evaluation of grant and

San Diego Community College District Director of Administrative Services Dr. C. Hannan, Computer Center Director J. Rust, and Board President C. Reid discuss long-term hardware needs.

funding applications. And the complex reporting procedures of student financial aid programs, accounts receivable and payable functions, and personnel/payroll operations combine to contribute to the accounting chores that have made the days of the manual bookkeeper a thing of the past.

By the same token, with multi-campus instructional sites, course registration has become a complex planning process, rivaled only by the detailed records involved in grade reporting, calculating grade point averages, course completions, and overall student status reporting. In addition, faculty are clamoring for more sophisticated computer programming that can aid remedial instruction, enrich course work, and facilitate test generation and evaluation.

To deal with these issues, senior management — in this case the president, vice presidents, provosts, and trustees — must have a continuing involvement in overseeing and planning for development of the computing resource.

PLANNING

Once you have determined what is available and what is needed, you as a board member or senior manager should prepare a complete short- and long-range computing services master plan. Remember that especially in long-range planning, one cannot expect to see immediate, tangible results in most aspects of computing. The problems which took years to accumulate will not disappear in six months, although a beginning can be made.

What should the plan do? It will allow you to monitor progress and measure effectiveness and should take into account user needs, required systems, personnel and management, and budget restrictions.

It must also:

- Establish computing goals and priorities within the institution;
- Consider all administrative software requirements, what student and financial information systems are needed, and whether these systems should be on-line data base managed systems;

Cuyahoga Community College Professor John McLellan and student utilize CCC's academic computing network.

- Decide what the establishment of these priorities means organizationally, budgetarily, and functionally for the institution and what the lines of responsibility will eventually be;
- Determine who will make the ultimate decisions on priorities, budgets, and systems, and who will be responsible for the day-to-day operation of the center;
- Project personnel needs, based on the decisions above.

If the master plan is broken down into its component parts, further questions can be formulated to help evaluate your computing decisions in each area of concern.

PRIORITIES

Objectives, Priorities, and Planning

Once basic needs have been analyzed, objectives and priorities can be established. Administrative and academic systems must be evaluated, priorities for each segment established, and decisions made as to which projects and capabilities will receive first consideration.

Although administrative uses were among the first applications of computer technology on campus, many colleges have recently found it necessary to provide tutorial and remediation modes for their disadvantaged students—tools which the computing resource can also provide.

Exceptional students as well can benefit from computer-assisted instruction (CAI) or computer-managed instruction (CMI) via problem solving, gaming, and simulation modes. The appeal of this aspect of computer technology is very simple—all levels of a student's academic ability can be challenged and improved.

But regardless of the extent to which CAI or CMI is contemplated, numerous questions must be asked of planners and computer users before decisions are made regarding priorities. Among them are:

- What will take precedence—academic or administrative computing? Will the functions be split or developed concurrently?
- If administrative computing has the first priority, what types of information and reports are required and/or desirable?
- If computer-assisted instruction (CAI) and computer-managed instruction (CMI) are going to be supported, how much instructional assistance is to be provided to students and faculty?
- What budgetary restrictions exist, and to what extent can they be modified?
- How much does the budget permit . . . now, and in the future . . . for the ongoing development of systems tailored to the unique and changing requirements of the institution?

PERSONNEL / ORGANIZATION

Decisions regarding data processing personnel, particularly at the management level, are among the most difficult for a college administration to make. The demand for competent computing management staff is extremely high, and the supply of experienced talent is limited. Frequently, higher educational institutions are just not able to keep salaries on a par with private industry in the data processing sector and consequently lose talented and experienced managers to other DP-related fields.

Genesee Community College President Dr. S. Steiner (seated) previews on-line computer system with Computer Center Director T. Dillow and GCC Dean of Administration A. Davey.

Computing for higher education is not like computing for a bank, the space program, or any other enterprises. It requires specialized knowledge and familiarity with programs and applications not obtainable anywhere else than in a college computing environment. Given the problems enumerated before, your institution must make provisions to assure a consistent, stable computing management.

There are other questions to be asked, too — questions such as:

- Does the existing staff have the technical and subject matter expertise to upgrade systems and run the new facility?
- How should the computing organization function in order to respond to priorities?
- Does the quality and quantity of the computing staff need to be upgraded to respond to new demands established?
- Who will carry on the training function for these new responsibilities and for the new job functions?
- Are present personnel ready to be trained for more sophisticated computing tasks?
- Does a user liaison function exist? How will they train the end user and coordinate the overall use of the computing facility?

- Can the present staff handle the myriad of enhancements required? If not, how can appropriate senior-level people be recruited, and are funds available to pay them at industry scales?
- How will the new computing resource be managed and governed?

MANAGEMENT/GOVERNANCE

One answer that many institutions have found to these questions is to have the computing director report directly to a vice president whose responsibilities include keeping the board and the appropriate policy group informed so that they can make decisions on allocation of resources to computing. Without this direct accountability, an institution's major computing dilemmas can be ignored for too long—until real problems become critical.

Senior management and trustees must be involved in overseeing the computing operation so that when difficult data processing decisions have to be made, management is familiar with the institution's needs, its plans, and its computing

Northampton County Area Community College faculty and staff attend Professional Development Day on ways computerization can enhance course curricula.

J. Mendez, President of foundation which supports Puerto Rico Junior College, and Computer Center Director X. Caro edit long-range Computing Services Master Plan.

progress to date. This type of management structure will be able to respond quickly to policy changes and decisions.

To examine the effectiveness of your organizational structure, the following questions must be answered:

- What does the existing governance structure look like?
- Who establishes user priorities?
- With whom does software development planning responsibility rest?
- Is the computer center manager to be a technician or a manager?
- Will he/she report to senior administration, to the trustees, or to a computer governance committee?
- Who will make basic personnel decisions?
- How will recommendations and decisions on new hardware acquisitions be made?
- How can stability be maintained at the senior management level? In the mobile data processing field, what assurances can a college have of continuity in development?

HARDWARE

Many institutions somehow believe that by acquiring a new and more sophisticated piece of hardware, they will automatically improve their computing efficiency. This thinking is equivalent to believing that buying your son or daughter a new car will automatically result in a driver's license and knowledge of how to operate the vehicle responsibly. What's more, how do you decide whether to buy an economy car, a station wagon, or a motorcycle?

Purpose and **end use** must be considered, **technical skills** required for operation of the hardware must be established, and **costs** examined in perspective as well.

We will not provide a series of questions on hardware here, for it is an area that should be evaluated by your technical people. Be certain, however, that you ask:

- What will this equipment do that it is not now capable of doing?
- What new software programs will be needed/available to go along with the new hardware?
- Would an "on-line" or a "batch" processing system be the best for your institution? What impact does this have on your hardware decision?
- Who will be able to operate and program the new hardware for maximum efficiency? Will additional staff and budget be required to do so?

BUDGET

Dollars are always an important consideration in major computing decisions. **What will it cost?**

This question must be asked in a framework not of pure dollar investment, but of increased cost-effectiveness, increased service, and improved user satisfaction.

Can your institution afford **not** to train its graduates in computing? Can your institution afford to miss out on governmental aid because information for a crucial report

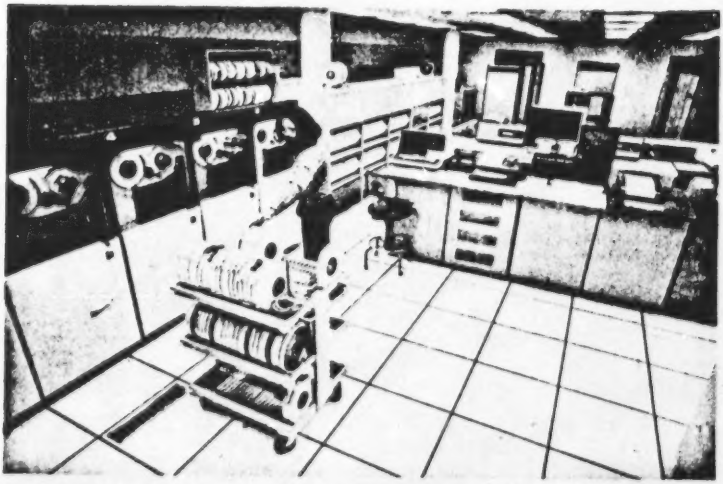
cannot be provided in a timely manner?

What are the hidden costs involved? What of personnel, software development, and management? What controls will you have regarding budget overruns? How can overruns be avoided if **actual** facility usage **exceeds** planned usage by 150%?

ONE SOLUTION

In search of a solution, a number of our member institutions have gone beyond their internal computer staff to seek special, professional management expertise. When administrators and trustees have asked some of the questions cited before, they have discovered that their computing staff does not always have adequate answers. They have either not thought through the planning process, or they may be ill-equipped to give adequate input by virtue of a lack of experience in the specialized area of educational computing.

Although some colleges try to solve this problem by hiring consultants with the necessary **technical** or general



The Fairbanks center of the University of Alaska Computer Network (UACN) serves all computing needs for the state's entire community college system.

management expertise, they soon discover that experience in the management of educational computing is of paramount importance.

These institutions have elected to hire outside computing resource management firms **specializing in educational computing** for several reasons:

1. The specialists have extensive experience in solving similar problems for other community and junior colleges;
2. They can hire much higher level management personnel — at salaries an institution could not afford to pay within existing salary structures;
3. A management contract is written with explicit performance objectives, timetables, and built-in accountability. This computing investment must, by contract, produce results.

SUMMARY

Certainly the issues raised in this brochure are complex ones, but they can be sensibly addressed by senior management, however lacking in computer expertise, if the basic questions can be asked.

We at the ACCT/AACJC recognize that a more sophisticated computing resource is a necessity for the survival of a modern institution of higher education. These considerations, we hope, will better prepare you to make these critical decisions in the 1980's.

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